Operating Instructions

HC 960

Version 2.5

The dissemination of information from, and reproduction of, these documents as well as the utilisation and communication of their content is not permitted unless specifically authorised. Any infringement shall result in liability for damages. All rights are reserved, particularly with regard to the granting of patents or registration of utility models.

.

Table of contents

1. General information 2
1.1. Operating states 2
1.2. HC960 operating modes 2
2. Meaning of parameters 2
3. Graphical representation of functions 4
4. Programming the parameters 5
5. Chipper control sequence (Normal RPM = 0) 6
6. Chipper control sequence (Normal RPM > 0) 7
7. Operating hours counter 8
8. Output assignment 8
9. Amphenol connector 9
10. AMP connector 10
11. Technical data 11
12. Important information on use 12
13. Repairing devices 13
14. Disposal of devices 13
15. Documentation information and history 14
17. Legal information 14

 © ehb Errors excepted

1. General information

The HC960 chipper controller includes automatic control for the feed rollers of a wood chipper, a revolution counter, a daily counter and a total operating hours counter. When operating the HC960, a distinction is made between two different operating states.

1.1. Operating states

Normal operation

In normal operation the HC960 has a display function. Depending on whether the blade shaft is rotating or not, either the speed or the total operating hours are displayed.

Before the HC960 can be used, a basic parameter setting must be made. On the following page the individual parameters are listed both with their designation (these appear in the display) and their meaning.

Programming the parameters

Setting different basic values to adapt the HC960 to different chipper types. Programming the parameters is only necessary during initial commissioning.

1.2. HC960 operating modes

When operating the HC960, a distinction is made between fully automatic (Normal RPM parameter > 0) and semi-automatic mode (Normal RPM parameter = 0). The user can decide for himself in which operating mode he wants to operate the HC960.

In semi-automatic mode, the blade shaft must be raised to the desired speed after starting the diesel engine. This target speed can then be saved by pressing the set button. The feeder is switched on at the same time. The set display flashes until the target speed is set for the first time. If the speed of the blade shaft is changed during operation and then the set button is pressed again, the new target speed is saved. This happens every time the Set button is pressed.

2. Meaning of parameters

Name	Meaning	Remark
Normal RPM	Target speed	Preset target speed which the blade shaft should hold and at which the feed rollers are started (if a restart speed is programmed, this has priority; see also Return RPM parameter). After a drop in speed, the target speed must be reached again in order to switch on the feed rollers again. If the value "0000" is entered here, this means that the blade shaft must be brought to a certain speed after starting the motor, which can then be saved by pressing a button (learn function). **Permitted value: 0 - 5000 rpm** The limits are influenced by the settings for overspeed and underspeed
Return RPM	Restart speed	Speed at which the feed is switched on again. (Note: this parameter has priority over the parameter "n"). It is only to be used in semi-automatic mode. A value should be entered here which is slightly below the target speed. As the value for the normal speed in this operating mode can be changed at any time via the learn function, it is recommended to enter a percentage value. In fully automatic mode the value "0" must be entered here. The entry can be a percentage or an absolute value, depending on the procedure for entering underspeed. **Permitted value: 0 - 99% or 0 - 5000 rpm** The limits are influenced by the settings for overspeed and underspeed

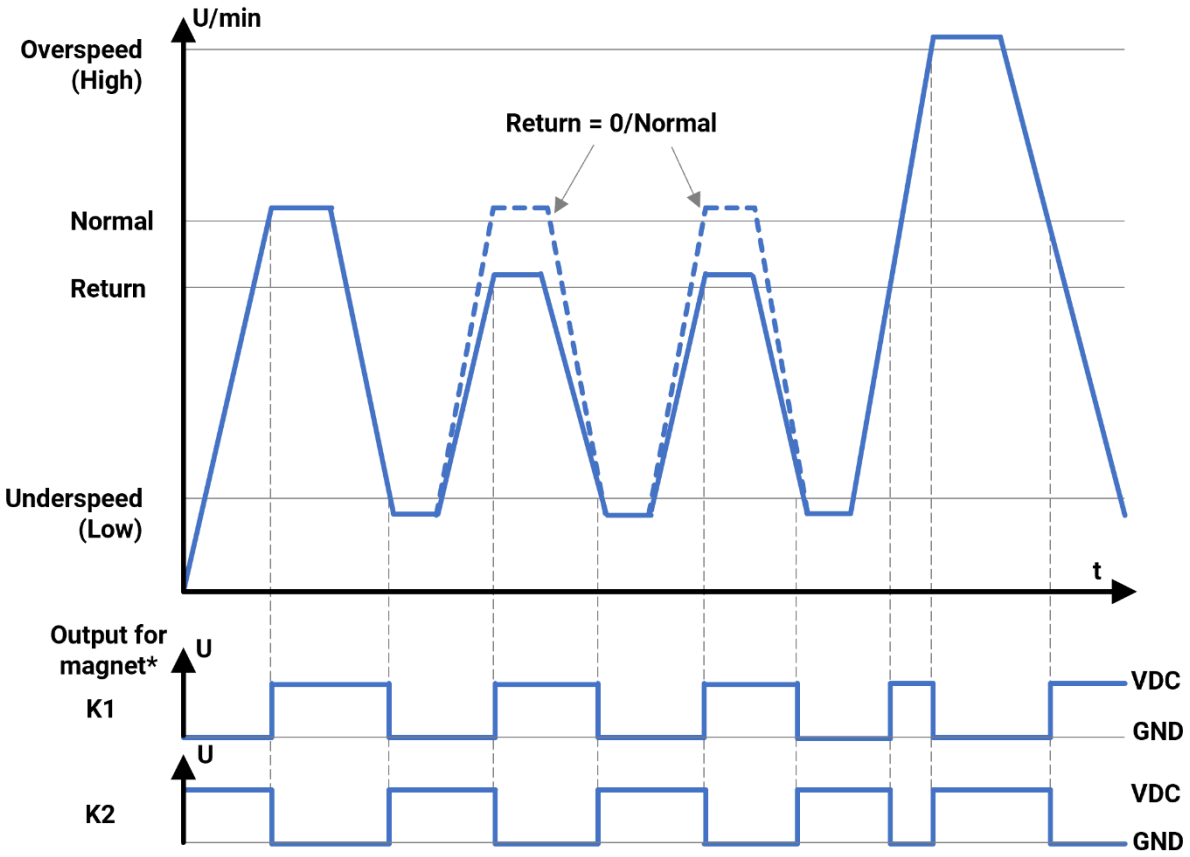
© ehb Errors excepted

LOW RPM	Underspeed	Deviation from the target speed. If the speed falls below this minimum speed, the feeder is stopped to allow the blade shaft to reach its target speed again. The underspeed can be entered both as an absolute value and as a percentage deviation from the target speed. To enter a percentage deviation, use the minus button (down arrow) to go past zero. A percentage value is indicated in the display by a "%". For example, "5%" corresponds to a percentage deviation of 5%. If the display shows "0850", for example, this means that 850 rpm has been programmed as underspeed. If a "zero" is entered for this parameter, underspeed is not monitored. **Permitted value: 0 - 99 % or 0 - 5000 rpm**
Over RPM	Overspeed	Upper permissible speed of the blade shaft. If this speed is reached or exceeded, the feed rollers are stopped. The entry can be a percentage or an absolute value, depending on the procedure for entering underspeed. If a "0" is entered for this parameter, overspeed is not monitored. **Permitted value: 0 - 99% or 0 - 2700 rpm**
IPR rotor	Pulses per rotation	Number of pulses emitted by an initiator per revolution of the blade shaft. **Permitted value: 1 - 60**
Confirm start	Confirm start	Selection of whether the initial start of the feed must be confirmed with "set" for increased operator safety. **Permitted value: Off/On**
RPM-sensor	NPN/PNP	With the selection NPN/PNP the frequency input can be configured to the type of input signal.
Set PW	Set password	Set password to access the parameter menu. **Permitted value: 0000 - 9999**
Daily password	Password for the daily operating hours counter	Set password for resetting the daily operating hours counter. **Permitted value: 0000 - 9999**
Factory setting	Factory setting	Reset HC960 to factory settings. No. shows how often the option has already been used. **Permitted value: No/Yes**
Set total hours	Set total hours	Set total operating hours. **Permitted value: 00000 - 99999**
Language	Language settings	Setting the language **Permitted value:**
Exit	Exit	Exit parameter menu:

© ehb Errors excepted

3. Graphical representation of functions

This representation refers to the software S02422.



* The output corresponds to the respective pictogram on the pin assignment (page 9).

© ehb Errors excepted

4. Programming the parameters

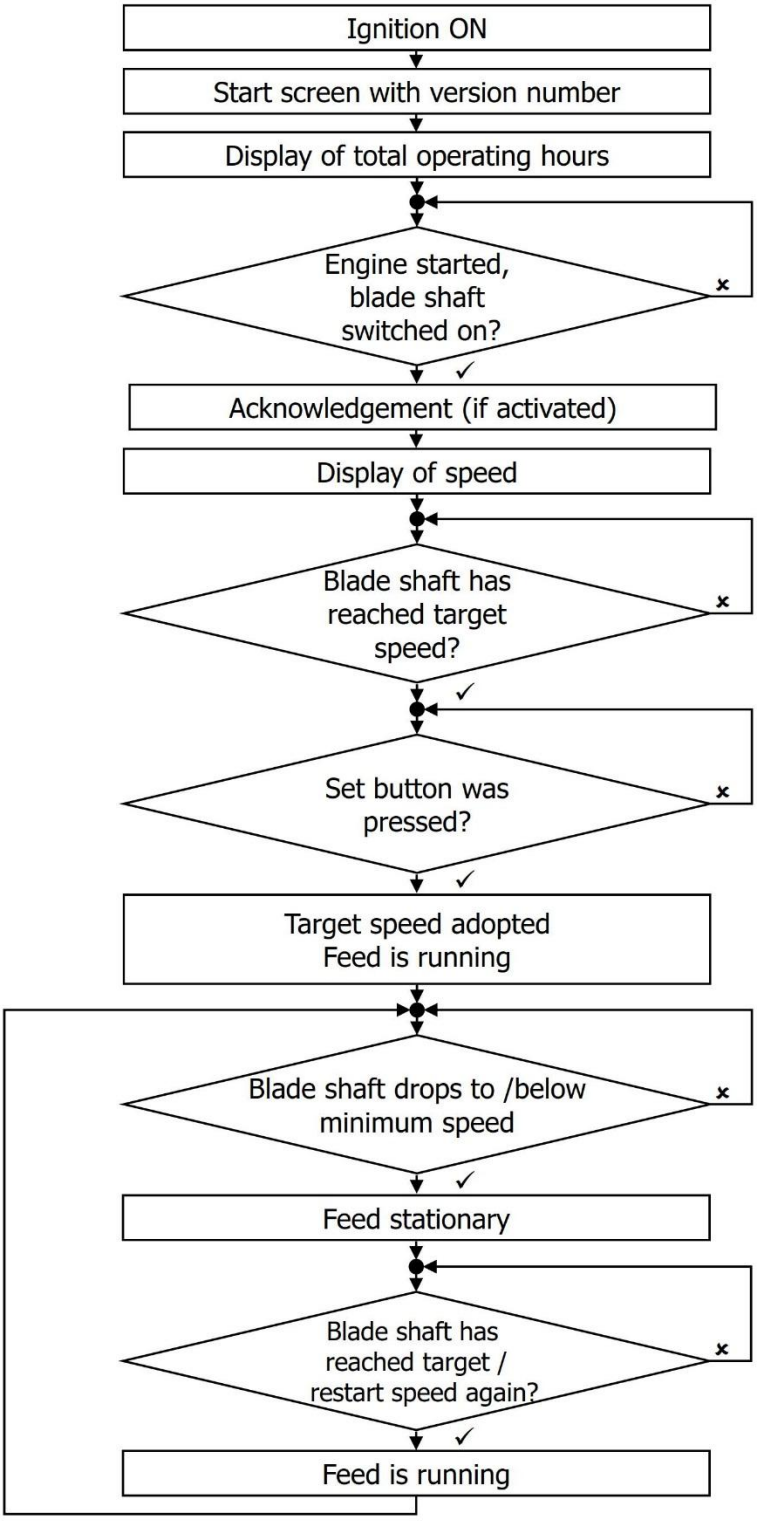
The parameters must always be programmed when the machine is at standstill. To access the parameter setting in operating mode, switch on the device while holding down the set button. Press the set button until the display shows "*** parameter ***". Use ↙ and ↗ to scroll to the desired parameter. Use "set" to be able to change the parameter. Afterwards the value can be adjusted with ↙ and ↗ and saved with "set".

Termination of programming

If programming is terminated by switching off the device, all changes made since the last time the set button was pressed are retained.

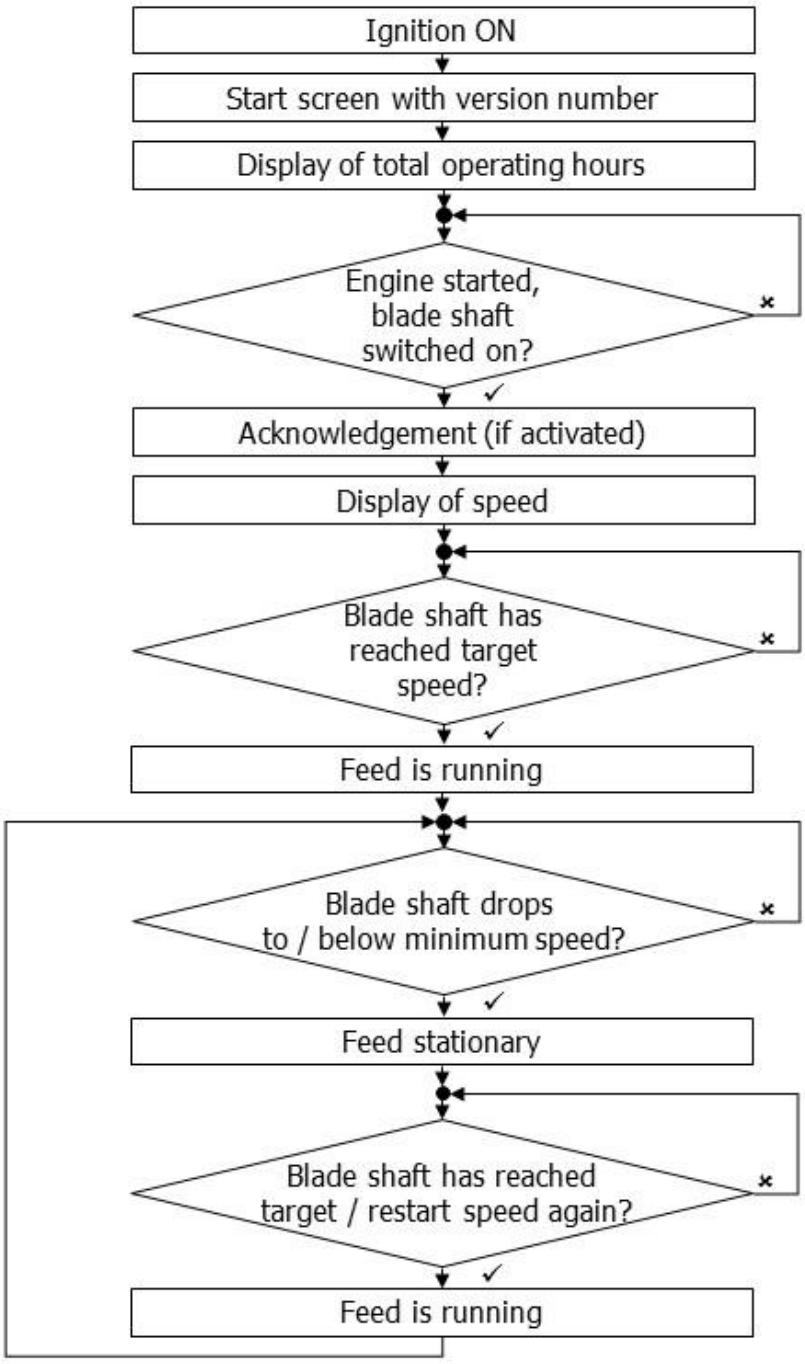
© ehb Errors excepted

5. Chipper control sequence (Normal RPM = 0)



© ehb Errors excepted

6. Chipper control sequence (Normal RPM > 0)



 © ehb Errors excepted

7. Operating hours counter

The HC960 has two independent operating hours counters: A resettable daily operating hours counter, which can be used for maintenance intervals, for example, and a settable total operating hours counter.

While the blade shaft rotates, its speed is automatically displayed. If you wish to display the daily operating hours instead, briefly press the set button once in fully automatic mode (Normal RPM greater than zero). In semi-automatic mode (Normal RPM equals zero), however, the set button must be pressed for longer than 3 seconds, as in this operating mode a brief keystroke will cause a new target speed to be adopted.

To clear the daily operating hours counter, press the set button for longer than 3 seconds in both operating modes. After these 3 seconds have elapsed, there is a switchover to the display of the daily operating hours. After a further 3 seconds (the set button is still pressed), the daily operating hours counter is cleared. “0:00" appears. The specified times apply in each case starting from the speed display.

If no button is pressed for ten seconds, there is an automatic switchover back to the speed display.

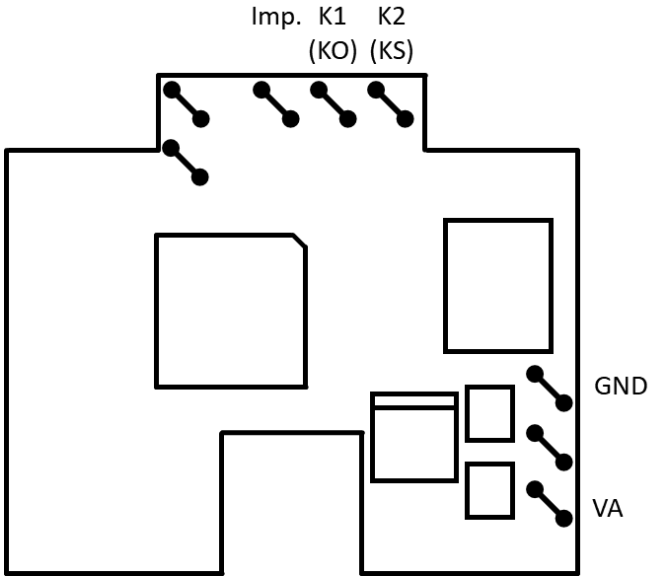
When the blade shaft is stationary, the total operating hours (th = total hours) automatically appear in the display. Here too, briefly pressing the set button switches to the display of daily operating hours.

The procedure described above for resetting the daily operating hours counter also applies here. If no button is pressed for ten seconds, the display automatically switches to the total operating hours.

The total operating hours counter can be set via the parameter menu.

8. Output assignment

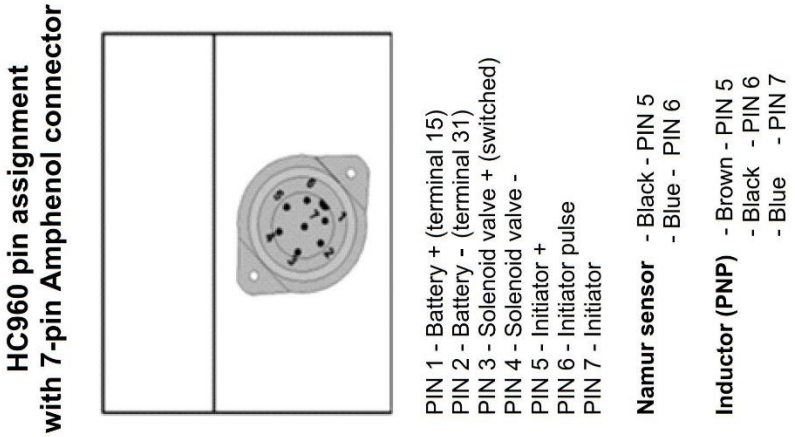
Depending on whether you need a N.O. or a N.C. contact for your magnet of the feed control, select the appropriate contact on the HC960. Please also note the function of the output states, which are described in detail in Figure 1 on page 4.

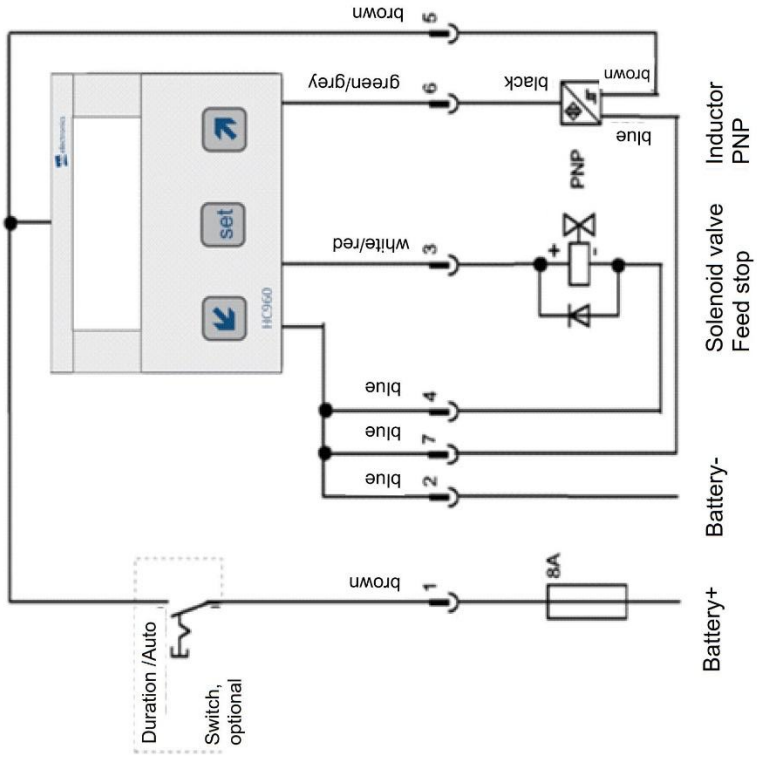


Pin assignment

© ehb Errors excepted

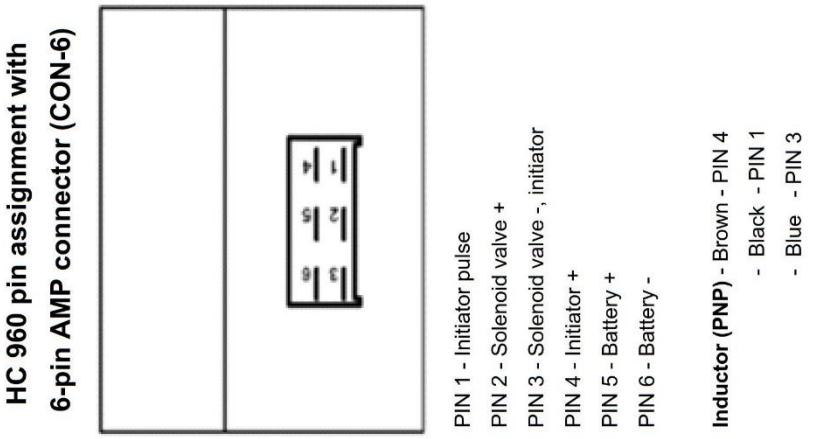
9. Amphenol connector

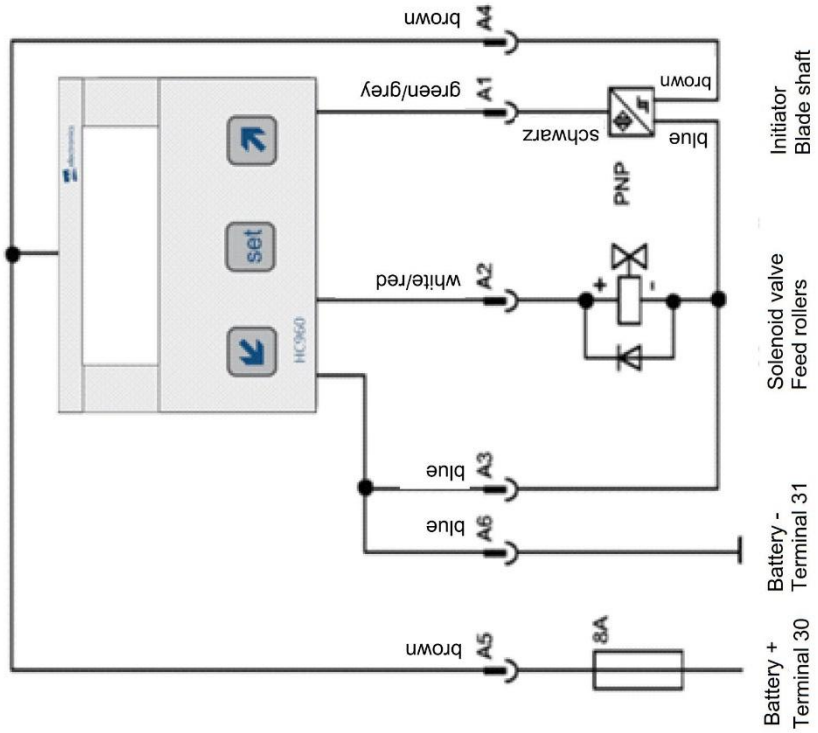




 © ehb Errors excepted

10. AMP connector





© ehb Errors excepted

11. Technical data

Electrical data:

Voltage range	8-32V
Operating temperature	-20 °C to +70 °C temporary discoloration of the display
Storage temperature	-30 °C to +80 °C
Inputs	Speed input for inductive encoder
Outputs	Output for hydraulic valve 2A) semiconductor, short-circuit protected
Total operating hours counter	0…99999 h
Daily operating hours counter	0…99:99 h
Speed measurement	1…5000 rpm
Pulses per rotation	1...60
Lower speed limit value	0...99% of target speed
Restart speed	0...99% of target speed

Visualisation:

Display typ	LCD
Resolution	32x128 Pixel
Background lighting	yes
Display	Black and white graphic display

Mechanical data:

Housing dimensions (L x W x H)	82 x 80 x 57 mm
Housing dimensions 7pin (L x W x H)	82 x 80 x 100 mm
Housing dimensions 6pin (L x W x H)	82 x 80 x 89 mm
Mounting dimensions (L x W x H)	82 x 80 x 77 mm (with rubber-bonded metal)
Housing material	ABS, PC (UV stabilized), light grey, Cover screw V2A
Weight	192g (without mounting connector)
Installation	4 x rubber-bonded metal, M4x10
Protection class	IP54
Connection	7pin. Amphenol connector or 6pin AMP-CON-6 connector

Test standard:

Humidity	DIN EN 60068-2-3
Vibration	DIN EN 60068-2-6
Impact	DIN EN 60068-2-27
EMV	DIN EN 61000-6-4, DIN EN 61000-4-20, DIN EN 61000-4-2, DIN EN 61000-4-3, DIN EN 61000-4-20, ISO 11451-1, DIN EN 61000-4-4, 61000-4-5, DIN EN 61000-4-6
CE label	according to directive 2014/30/EU

© ehb Errors excepted

12. Important information on use

Test	Before delivering the installed HC960 to the end user, a brief functional test should be carried out in the peripheral equipment that is to be used.
Use	This device is to be operated only in combination with the supplied accessories. Protect the device from moisture and dust. Cleaning should only be carried out with a slightly damp cloth and mild detergent. Comply with the general accident prevention regulations during operation.
Safety	Do not operate the HC960 within range of strong electromagnetic fields. Observe the temperature specifications. Protect the device especially from overheating.
Installation	Observe the notes of the manufacturer of the plugs and cable harnesses when installing the device.
Storage	An unused HC960 may only be stored within the temperature range -20°C to + 85°C.
Shipping	The original packaging must be used for all shipments. Improper packaging is regarded as *negligence* and results in any claims for repair under guarantee being forfeited.
Maintenance	The HC960 requires no maintenance and no special upkeep over its entire service life.

ATTENTION!
Never use a high-pressure cleaner to clean the device.
Instruct your service personnel that any high-pressure cleaning will cause damage and voids the warranty.

© ehb Errors excepted

13. Repairing devices

Should the device require repair work, please return it to:

ehb electronics gmbh
Hans-Böckler-Str. 20
30851 Langenhagen
GERMANY

Please make sure that you include a **written fault description**. This will facilitate the work of the ehb electronics gmbh service department and ensure faster return of your HC 960.

NOTE!

ehb electronics GmbH assumes liability only for the proper execution of services and the correct characteristics of the materials used. Any further claims such as for loss of profit and for direct and indirect consequential damages such as loss of data are excluded.

ATTENTION!

Damages arising from improper packaging of the device for shipping and/or unauthorised intervention will invalidate the guarantee.

14. Disposal of devices

Product

Please dispose of the product at the end of its service life in accordance with the legal provisions.

Rechargeable batteries and other batteries

As the final consumer, you are legally obliged to return all used rechargeable batteries and other batteries (in accordance with the EU Batteries Directive). Disposal as household waste is not permitted!

Batteries containing hazardous substances are identified by the symbol shown here, this symbol indicating that disposal as household waste is not permitted. The chemical symbols for the hazardous heavy metals are:

Cd (cadmium)
Hg (mercury)
Pb (lead)

If a battery contains a hazardous heavy metal, the corresponding chemical symbol will appear on the battery, e.g. beneath the waste container symbol shown above. You can dispose of used batteries/rechargeable batteries free of charge at your municipal collection points
and wherever batteries/rechargeable batteries are sold.

By acting in accordance with this disposal requirement, you will be fulfilling your legal obligations as well as contributing to the protection of the environment.
Your compliance in this matter is appreciated.

 © ehb Errors excepted

15. Documentation information and history

Project:	HC 960
Type of document:	Technical document
Version:	1.0
Prepared on:	27/02/2007
Prepared by:	Mühlhausen ehb electronics gmbh, Hanover

16. Revisions:

Version:	Preparation/Revisions:	Prep./Rev. date:	Preparer/Reviser(s):
1.0	Consolidation DE, EN, IT	23/06/2006	Mü
1.1	Harting connector EN added	27/02/2007	Mü
1.1	Layout; adaptation of text pt. 13	20/01/15, 28/06/17	Hag
1.2	Adaptation of "Installation" notes for use	04/12/2017	Ak/hag
2.0	Revision for HC960 V2 Edited	20/03/2020, 25/03/2020	Hk Hag
2.1	Pt. 2 “Meaning of Parameters”, adaption, copyedit	10/11/2020	Jäk/Hk/Hag
2.1	Pt. 9 – Amph.-Connector, drawing adapted	23/11/2020	Jäk/Hag
2.2	Pt. 8 – Internal Connector drawing adapted, formatting	05/03/2024	Hk
2.3	Unification of RPM wording	23/09/2024	Hk
2.4	Pt. 3 Layout	15/07/2025	Lut
2.5	9 Correction in the figure	01/04/2026	Lut

17. Legal information

Customer service:
Tel. +49-511-123207-0
Email info@ehb-electronics.de

Hans-Böckler-Straße 20
30851 Langenhagen - GERMANY
www.ehb-electronics.de
www.ehbshop.de

© ehb Errors excepted